

What is claimed is:

1. An oscillator comprising:
    - an active device;
    - a substrate;
    - a microstrip line formed on the substrate; and
    - a dielectric block disposed to couple with the microstrip line;

wherein the microstrip line and the dielectric block form a resonator, the active device and the resonator are electrically connected with each other, the active device produces a negative resistance in a desired oscillation frequency band, and a resonance frequency of the lowest order mode of the dielectric block is lower than the desired oscillation frequency and a resonance frequency band of one of the higher order modes covers the desired oscillation frequency.
  2. An oscillator according to claim 1, wherein the substrate is a dielectric substrate.
  3. An oscillator according to claim 1, wherein the active device, the microstrip line, and the dielectric block are mounted on the common substrate.
  4. An oscillator according to claim 2, wherein the active device, the microstrip line, and the dielectric block are mounted on the common substrate.
  5. An oscillator according to claim 1, wherein the

active device is mounted on another substrate different from the substrate.

6. An oscillator according to claim 2, wherein the active device is mounted on another substrate different from the substrate.

7. An oscillator according to claim 1, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

8. An oscillator according to Claim 2, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

9. An oscillator according to claim 3, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

10. An oscillator according to claim 4, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

11. An oscillator according to claim 5, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

12. An oscillator according to claim 6, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

13. A transmitter-receiver module comprising:  
a local signal generator; and  
an antenna unit connected electrically to the local signal generator;

wherein the local signal generator includes an oscillator, and the oscillator comprises:  
an active device;  
a substrate;  
a microstrip line formed on the substrate; and  
a dielectric block disposed to couple with the microstrip line;

wherein the microstrip line and the dielectric block form a resonator, the active device and the resonator are electrically connected with each other, the active device produces a negative resistance in a desired

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oscillation frequency band, and a resonance frequency of the lowest order mode of the dielectric block is lower than the desired oscillation frequency and a resonance frequency band of one of the higher order modes covers the desired oscillation frequency.

14. A transmitter-receiver module according to claim 13, wherein the substrate is a dielectric substrate.

15. A transmitter-receiver module according to claim 13, wherein the active device, microstrip line, and dielectric block are mounted on the common substrate.

16. A transmitter-receiver module according to claim 13, wherein the active device is mounted on another substrate different from the substrate.

17. A radar system comprising:  
a local signal generator;  
a transmitter antenna connected electrically to the local signal generator;  
a mixer connected electrically to the local signal generator; and  
a receiver antenna connected electrically to the mixer;

wherein the local signal generator includes an oscillator, and the oscillator comprises:

an active device;  
a substrate;

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a microstrip line formed on the substrate; and  
a dielectric block disposed to couple with the  
microstrip line;

wherein the microstrip line and the dielectric  
block form a resonator, the active device and the resonator  
are electrically connected with each other, the active  
device produces a negative resistance in a desired  
oscillation frequency band, and a resonance frequency of  
the lowest order mode of the dielectric block is lower than  
the desired oscillation frequency and a resonance frequency  
band of one of the higher order modes covers the desired  
oscillation frequency, and

wherein the transmitter antenna radiates a signal  
generated by the local signal generator as a transmission  
signal, the receiver antenna receives a reflection signal  
that the transmission signal is reflected on a target, and  
the mixer mixes the reflection signal and the signal  
generated by the local signal generator.

18. A radar system according to claim 17, wherein  
the substrate is a dielectric substrate.

19. A radar system according to claim 17, wherein  
the active device, microstrip line, and dielectric block  
are mounted on the common substrate.

20. A radar system according to claim 17, wherein  
the active device is mounted on another substrate different

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from the substrate.